Habitats and Adaptations

3-2 The student will demonstrate an understanding of the structures, characteristics, and adaptations of organisms that allow them to function and survive within their habitats. (Life Science)

3.2.2 Explain how physical and behavioral adaptations allow organisms to survive (including hibernation, defense, locomotion, movement, food obtainment, and camouflage for animals and seed dispersal, color, and response to light for plants).
Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/Future knowledge: Students have been introduced to how environments throughout the world support different plants (1-2.5) and animals (2-2.4). In 6th grade (6-2), students will develop a more in-depth understanding of the structures, processes, and responses of plants that allow them to survive and reproduce.

It is essential for students to know that plants and animals have special traits or characteristics that allow them to survive in their particular habitats. These special traits or characteristics, called *adaptations*, are necessary for a plant or animal to survive if its surroundings change.

- *Physical adaptations* can be a body structure that an organism has that allows it to meet its needs in its habitat.
- *Behavioral adaptations* can be an activity or action that helps an organism survive in its habitat.

Physical and Behavioral Adaptations of Animals
Some adaptations of animals can help them find food or water, protect them from danger, or help them survive when conditions in the environment change. These adaptations include:

Hibernation

- A resting state that helps animals survive in winter.
- During hibernation, the animal's body processes, like breathing, slow down, and they survive on stored food or fat.
- Many animals, for example insects, birds, reptiles and some mammals, eat a lot of food in the autumn months to store up fat.
- Then they burrow into the ground or curl up under leaves, or hide themselves in dens, safe from the winter cold and enemies.
- When the temperature rises in the spring, the animal wakes up and leaves its hiding place.

Defense

- Some animals have special adaptations to protect themselves from being hurt, killed, or eaten.
- These special defense mechanisms include physical adaptations such as quills and claws, and behavioral adaptations such as taking flight, tricking (mimicry, playing dead), spraying, or fighting.

Locomotion

- In order for animals to find the resources they need for food, shelter, or space, they must be able to move around.

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- Animals have special structures for moving depending on where they live, for example above ground (swinging, climbing and flying), on the ground (crawling, walking, hopping), or in the water (floating, swimming and diving).

Movement

- The movement of animals over the same route in the same season each year is called *migration*.
- This behavior allows animals to take advantage of resources (like food or water) in one location when they run low in another location.

Food obtainment

- Animals have special structures used for getting food, for example the beaks of birds, mouths of insects, teeth, or claws that are shaped in different ways depending on the type of food they eat.

Camouflage

- Camouflage is a color or pattern that allows an animal to blend into its environment and protects it from being seen by its enemies or allows it to sneak up more easily on their food.

Physical and Behavioral Adaptations of Plants

Plants cannot move like animals can, but they can respond to a change in their environment. Some examples of plant adaptations for survival include:

Seed dispersal

- Most plants produce a large number of seeds because most seeds do not survive.
- In order to ensure that seeds will survive, they must be carried away (*dispersed*) from the parent plant.
- Some seeds have hooks on them that allow them to attach to animal fur or clothes.
- Some seeds are able to float in water.
- Some seeds are light and have wings or thin hairs that allow them to be carried away by wind.
- Some seeds are eaten by animals and deposited in areas away from the parent plants.

Color

- Flowers come in a variety of shapes, sizes, and colors.
- Petals are colored and scented to attract insects and other creatures for the purposes of pollination.
- The coloration of parts of some plants (fruits for example berries, or flower petals) makes them attractive to some animals (for example birds or bees).

Response to light

- A plant needs sunlight or some other light source to survive.
- It uses the light for the energy it needs to make its food.

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- A plant always turns its leaves and bends its stems toward the light.

It is not essential for students to understand the concepts of plant defense mechanisms, dormancy, or to explore the various other types of plant tropisms, as they will investigate this in 6th grade (6-2.7).

Assessment guidelines:
The objective of this indicator is to *explain* the effects of physical and behavioral adaptations on survival; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the various ways that survival is affected by physical or behavioral adaptations of plants or animals. However, appropriate assessments should also require students to *exemplify* physical or behavioral adaptations of plants and animals that allow them to survive; *classify* an adaptation based on how it helps the plant or animal to survive; or *summarize* the purpose of a particular adaptation for survival of the plant or animal.